

WHAT IS CLAIMED IS:

1. A solid-state imaging device, comprising:  
a substrate with a flat board form that is made of an insulating  
5 resin;  
an imaging element that is fixed onto the substrate;  
a rib with a rectangular frame form in a planar shape, which is  
provided on the substrate so as to surround the imaging element;  
a transparent plate that is fixed to a top face of the rib;  
10 a plurality of wirings for conducting electricity from inside of a  
package to outside of the package, the package being comprised of the  
substrate, the rib and the transparent plate; and  
thin metal wires provided in a space within the package, which  
connect electrodes of the imaging element with the respective wirings,  
15 wherein each of the plurality of wirings includes: an internal  
electrode disposed on a surface with the imaging element mounted thereon;  
an external electrode disposed on a rear surface of the imaging-element  
mounted surface and at a position corresponding to the internal electrode;  
and an end face electrode disposed on an end face of the substrate, which  
20 connects the internal electrode and the external electrode, and  
an end face of the substrate, a side face of the rib and an end face of  
the transparent plate, which correspond to a side face of the package, form a  
substantially coplanar surface.
- 25 2. The solid-state imaging device according to claim 1, wherein the end  
face of the substrate, the side face of the rib and the end face of the  
transparent plate are in a plane formed by cutting them sequentially in a  
single operation.
- 30 3. The solid-state imaging device according to claim 1, wherein an  
internal side face of the rib has a tilt such that the internal side face spreads  
outwardly from a face of the substrate toward the transparent plate.
- 35 4. The solid-state imaging device according to claim 3, wherein the  
internal side face of the rib has a flat surface, and an angle of the tilt is  
within a range of 2° to 12° with respect to a direction perpendicular to the

face of the substrate.

5. The solid-state imaging device according to claim 1, wherein an  
orange peel skin pattern or a grained pattern is formed on an internal side  
5 face of the rib.

6. The solid-state imaging device according to claim 1, wherein an  
internal side face of the rib has a flat surface, and an external side face and  
the internal side face of the rib are perpendicular to the face of the  
10 substrate.

7. The solid-state imaging device according to claim 1,  
wherein the end face electrode is disposed in a recess that is formed  
on the end face of the substrate, and  
15 a surface of the end face electrode forms a substantially coplanar  
face with the end face of the substrate, or is recessed relative to the end face  
of the substrate.

8. The solid-state imaging device according to claim 1, wherein a  
20 surface of the external electrode forms a substantially coplanar surface with  
the rear surface of the substrate.

9. The solid-state imaging device according to claim 1, wherein a  
surface of the external electrode is recessed relative to the rear surface of  
25 the substrate.

10. The solid-state imaging device according to claim 9,  
wherein an insulation film is formed on the rear face of the  
substrate, and  
30 the insulation film and the external electrode are arranged so as not  
to overlap each other.

11. The solid-state imaging device according to claim 9,  
wherein an insulation film is formed on the rear face of the  
35 substrate, and  
a peripheral portion of the external electrode and the insulation film  
are arranged so as to overlap each other.

12. A method for producing the solid-state imaging device according to claim 1, comprising the steps of:

5 forming a top-side conductive layer and a bottom-side conductive layer on a top face and a bottom face of a base material with a flat board form that is made of an insulation resin so that the top-side conductive layer and the bottom-side conductive layer correspond to a plurality of groups of the wirings for composing a plurality of the solid-state imaging devices, and forming a perforation conductive layer that penetrates through  
10 the base material so as to connect the top-side conductive layer and the bottom-side conductive layer;

providing a rib formation member for forming the rib on the base material at a boundary between regions, each of which is for forming one of the plurality of solid-state imaging devices, so that the rib formation  
15 member extends transversely with respect to the top-side conductive layer above the perforation conductive layer;

fixing the imaging element in each region surrounded by the rib formation member and connecting the electrode of the imaging element and the top-side conductive layer by means of the thin metal wire;

20 fixing the transparent plate to a top end face of the rib formation member; and

cutting the base material, the rib formation member and the transparent plate sequentially in a single operation in a direction perpendicular to the base material and in a direction that divides a width in  
25 a planar shape of the rib formation member into halves so as to separate the plurality of solid-state imaging devices into the respective pieces.

13. The method for producing the solid-state imaging device according to claim 12, wherein the rib formation member is formed in a lattice form.

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14. The method for producing the solid-state imaging device according to claim 12, wherein the rib formation member is formed on the base material by resin forming.

35 15. The method for producing the solid-state imaging device according to claim 14, wherein the resin forming is carried out by molding using molds.

16. The method for producing the solid-state imaging device according to claim 15, wherein, when forming the rib formation member by the resin molding, a sheet for suppressing generation of the resin flash is interposed  
5 between a mold for the resin molding and the base material.